National Institute of Environmental Health Sciences

Interannual variability of human plague occurrence in the Western United States explained by tropical and North Pacific Ocean climate variability

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Abstract:

Plague is a vector-borne, highly virulent zoonotic disease caused by the bacterium Yersinia pestis. It persists in nature through transmission between its hosts (wild rodents) and vectors (fleas). During epizootics, the disease expands and spills over to other host species such as humans living in or close to affected areas. Here, we investigate the effect of large-scale climate variability on the dynamics of human plague in the western United States using a 56-year time series of plague reports (1950-2005). We found that El Nino Southern Oscillation and Pacific Decadal Oscillation in combination affect the dynamics of human plague over the western United States. The underlying mechanism could involve changes in precipitation and temperatures that impact both hosts and vectors. It is suggested that snow also may play a key role, possibly through its effects on summer soil moisture, which is known to be instrumental for flea survival and development and sustained growth of vegetation for rodents.

Source: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2929061

Resource Description

Exposure : ☑

weather or climate related pathway by which climate change affects health

Precipitation, Temperature

Temperature: Fluctuations

Geographic Feature: ☑

resource focuses on specific type of geography

None or Unspecified

Geographic Location: ☑

resource focuses on specific location

United States

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Vectorborne Disease

Vectorborne Disease: Flea-borne Disease

Flea-borne Disease: Plague

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Time Scale Unspecified